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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,038	05/24/2001	Douglas J. McKnight	02879.P050	4266

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EXAMINER

CHOWDHURY, TARIFUR RASHID

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/866,038

Applicant(s)

MCKNIGHT ET AL.

Examiner

Tarifur R Chowdhury

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. **Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonehara et al., (Sonehara), USPAT 5,361,151.**

4. Sonehara discloses and shows in Figs. 1 and 2, a liquid crystal display device comprising:

- a liquid crystal layer (104) having a twist angle of about 63° (overlaps the claimed range at 63°);
- a polarizer (106) positioned to receive light from a light source and to polarize

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the light, the polarizer polarizing the light such that an angle β exists between a vector of the polarized light and a first alignment direction of the liquid crystal layer;

wherein β is in a range of about 0° to 90° (overlaps the claimed range at 0° - 13°) and wherein a value of $\Delta n d$ is about 0.13 - $0.40 \mu\text{m}$ (col. 10, lines 20-31) (overlaps the claimed range) where Δn is a birefringence of the liquid crystal layer and d is a thickness of the liquid crystal layer (col. 3, lines 26-67).

Since the range of the twist angle, angle β and the a value of $\Delta n d$ overlaps the claimed range, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a liquid crystal layer having the twist angle, the angle β and the value of $\Delta n d$ in the claimed ranges as defined in the claims to optimize performance and further since according to *In re Malagari*, 499 F.2D 1297, 182 USPQ 549 (CCPA 1974), overlapping ranges are at least obvious.

Accordingly, claims 15 and 16 would have been obvious.

5. Claims 1-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonehara as applied to claims 15 and 16 above and in view of Yang, USPAT 6,295,113.

6. Sonehara also discloses that the angle β overlaps the claimed range at 0° to 5° . Further, as explained above, Sonehara discloses all the limitations except that the value of the $\Delta n d$ is about $0.1 \mu\text{m}$ to about $0.12 \mu\text{m}$ (claim 1) and that the twist angle is about 80 degrees (claim 17).

Yang discloses a liquid crystal display device wherein the twist angle is about 70

to about 180 degrees (overlaps the claimed range) and the value of the $\Delta n d$ is about $0.1 \mu\text{m} - 0.2 \mu\text{m}$ (overlaps the claimed range) (abstract). Yang further discloses that such a liquid crystal display device is advantageous since it provides a suitable liquid crystal display with improved characteristics.

Yang is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use a liquid crystal layer having a twist angle of about 80 degrees and an $\Delta n d$ value of about $0.1 \mu\text{m} - 0.2 \mu\text{m}$.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of Sonehara by using a liquid crystal layer having a twist angle of about 80 degrees (claim 17) and an $\Delta n d$ value of about $0.1 \mu\text{m} - 0.2 \mu\text{m}$ (claim 1) to obtain a suitable display with improved characteristics.

Accordingly, claims 1 and 17 would have been obvious.

As to claim 2, Sonehara also discloses and shows in Fig. 1, that the liquid crystal display device further comprising:

- a first substrate(101) coupled to the liquid crystal layer (104);
- a second substrate (103) coupled to the liquid crystal layer (104), the first substrate and the second substrate defining the thickness d .

As to claims 3 and 4, Sonehara also discloses that the second substrate (103) comprises a plurality of reflective pixel electrode (102) (col. 3, lines 35-36).

As to claim 5, forming an integrated circuit on the substrate is common and known in the art and thus would have been obvious to avail a proven technique to optimize device performance.

As to claim 6, Sonehara further discloses that the first substrate is transparent and comprises a transparent electrode (105) (col. 3, lines 31 and 33-34).

As to claim 7, Sonehara also discloses that the display device includes a first alignment layer with first alignment direction and a second alignment layer with a second alignment direction formed on the first and second substrates respectively. Further, and the twist angle is typically determined by the angle between the first alignment direction and the second alignment direction.

As to claim 8, Sonehara discloses that a polarizer beam splitter can be used as a polarizing element (col. 5, lines 28-29).

As to claims 9, 10 and 13, using a field sequential light source in a liquid crystal display to provide images of various color in a single polarization direction is common and known in the art and thus would have been obvious to use. Further, the light source comprising three differently colored LEDs which are sequentially and separately turned on is common and known in the art and thus would have been obvious to optimize device performance.

As to claim 11, positioning a lens to receive modulated light from liquid crystal layer is common and known in the art and thus would have been obvious to optimize device performance (see subclass 95).

As to claim 12, housing the liquid crystal display within a head mounted display is considered as intended use and thus would have been obvious.

Response to Arguments

7. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

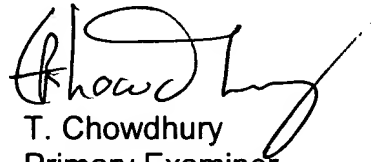
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (703) 308-4115. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7005 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.



T. Chowdhury
Primary Examiner
Technology Center 2800

TRC
September 13, 2003